

What is claimed is:

1. A method for intervertebral stabilization, comprising:
accessing a disc space between vertebral bodies;
delivering an expandable device into the disc space in an unexpanded condition;
expanding the expandable device with an expandable element to distract the disc space; and
placing a motion preserving device in a cavity of the expanded expandable device.
2. The method of claim 1, wherein accessing the disc space includes accessing the disc space from a posterior approach.
3. The method of claim 1, wherein accessing the disc space includes accessing the disc space from an anterior approach.
4. The method of claim 1, wherein accessing the disc space includes accessing the disc space from a posterior-lateral approach.
5. The method of claim 1, wherein accessing the disc space includes accessing the disc space from a lateral approach.
6. The method of claim 1, further comprising mounting the expandable device on a distal portion of a delivery instrument before delivering the expandable device.
7. The method of claim 6, wherein the distal portion includes the expandable element, and expanding the expandable device include includes placing polymerizable material in the expandable element.
8. The method of claim 7, placing the motion preserving device includes curing the polymerizable material in the expandable element.
9. The method of claim 1, wherein expanding the expandable device includes inflating the expandable element.

10. The method of claim 9, further comprising mounting the expandable device on the expandable element with the expandable element in a deflated condition before delivering the expandable device.

11. The method of claim 1, wherein expanding the expandable device includes moving a first portion and a second portion of the expandable device away from one another into contact with an endplate of an adjacent one of the vertebral bodies.

12. The method of claim 11, wherein the first portion and second portion are substantially rigid.

13. The method of claim 12, wherein the first portion and the second portion include bone engaging features along outer surfaces thereof.

14. The method of claim 11, wherein the first portion and the second portion extend between a proximal end and a distal end of the expandable device, and when expanded the first portion and second portion form a first height adjacent the distal end and a second height adjacent the proximal end, one of the first and second heights being greater than the other of the first and second heights.

15. The method of claim 14, further comprising orienting the greater one of the first and second heights anteriorly in the disc space.

16. The method of claim 1, wherein the vertebral bodies comprise a concavely curved portion of a scoliotic spinal column segment, and the disc space includes a collapsed height along one side of a midline of the spinal column segment, and expanding the expandable device restores the collapsed disc space and reduces the scoliotic curvature of the concavely curved portion.

17. The method of claim 1, further comprising:

temporarily supporting the disc space with the expanded expandable device before placing the motion preserving device; and

removing load supporting elements of the expanded expandable device to transfer spinal column loads to the motion preserving device.

18. The method of claim 17, wherein removing load supporting elements includes degrading the load support elements in situ.
19. A method for intervertebral distraction, comprising:
 - accessing a collapsed disc space between vertebral bodies;
 - mounting an expandable device on an expandable element at a distal portion of a delivery instrument;
 - delivering the expandable device into the disc space in an unexpanded condition with the delivery instrument;
 - expanding the expandable device by expanding the expandable element to restore a disc space height;
 - removing the expandable element from the expanded expandable device; and
 - maintaining the restored disc space height with the expanded expandable device.
20. The method of claim 19, further comprising placing bone filler material in the expanded expandable device.
21. The method of claim 19, wherein the expandable element is positioned in a cavity defined between first and second portions of the expandable device.
22. The method of claim 19, wherein the expandable element includes an interior inflatable with fluid.
23. The method of claim 19, wherein accessing the disc space includes accessing the disc space from an approach selected from the group consisting of: anterior, lateral, posterior-lateral, and posterior surgical approaches.
24. The method of claim 19, wherein expanding the expandable device includes moving a first portion and a second portion of the expandable device away from one another.
25. The method of claim 24, wherein the first portion and second portion are substantially rigid.

26. The method of claim 24, wherein first portion and second portion each extend between a proximal end and a distal end of the expandable device, and when expanded the first portion and second portion are separated by a first height adjacent the distal end and a second height adjacent the proximal end, one of the first and second heights being greater than the other of the first and second heights.
27. The method of claim 26, wherein the expandable device is tapered between the distal and proximal ends when expanded.
28. The method of claim 26, wherein the expandable device includes a stepped configuration between the proximal and distal ends when expanded.
29. The method of claim 19, wherein the expandable device includes a width that is substantially the same in the expanded and unexpanded conditions.
30. The method of claim 19, wherein the expandable device is radially expandable.
31. The method of claim 19, wherein delivering the expandable device includes orienting a convexly curved anterior wall along an anterior portion of the disc space.
32. The method of claim 31, wherein the expanded expandable device includes a D shape.
33. The method of claim 19, further comprising:
positioning a motion preserving device in the expanded expandable device; and
removing load supporting elements of the expanded expandable device to transfer spinal column loads to the motion preserving device.
34. The method of claim 33, wherein removing load supporting elements includes degrading the load support elements in situ.
35. A system for stabilizing a spinal column segment, comprising:

a delivery instrument including a shaft and an expandable element along a distal portion thereof;

an expandable device including a cavity, the expandable device being removably mountable to the expandable element with the expandable element in the cavity and each of the expandable device and the expandable element in an unexpanded condition, wherein the expandable device is deliverable with the delivery instrument to a spinal disc space in the unexpanded condition and thereafter expandable with expansion of the expandable element to distract the spinal disc space; and

a motion preserving device positionable in the cavity.

36. The system of claim 35, wherein the expandable element includes a balloon structure with an interior for receiving an expansion fluid.

37. The system of claim 36, wherein the expansion fluid is selected from the group consisting of: saline solution, compressed air, and radio-contrast fluid.

38. The system of claim 36, wherein the expansion fluid is a polymerizable material.

39. The system of claim 36, wherein the motion preserving device includes an elastic core formed by curing the polymerizable material.

40. The system of claim 36, wherein the shaft of the delivery instrument includes a lumen in fluid communication with the interior of the expandable element.

41. The system of claim 35, wherein the expandable device includes adjacent first and second portions extending between distal and proximal ends of the expandable device, the first and second portions being movable away from one another by expanding the expandable element.

42. The system of claim 41, wherein the first and second portions each define an outer surface with bone engagement members therealong.

43. The system of claim 41, wherein when expanded the first and second portions define a first height adjacent the distal end of the expandable device and a second height

adjacent the proximal end of the expandable device, one of the first and second heights being greater than the other of the first and second heights.

44. The system of claim 43, wherein the expandable device is tapered between the first and second heights.

45. The system of claim 43, wherein the expandable device includes a stepped configuration between the first and second heights.

46. The system of claim 41, wherein the first and second portions include bone growth openings therethrough.

47. The system of claim 41, wherein the first and second portions are substantially rigid and the expandable element is non-rigid.

48. The system of claim 41, wherein the first and second portions engage one another to maintain the expandable device in an expanded condition after removal of the expandable element from the cavity.

49. The system of claim 48, wherein at least a portion the first and second portions is degradable to transfer load to the motion preserving device.

50. The system of claim 35, wherein the cavity opens at a distal end and at a proximal end of the expandable device.

51. The system of claim 35, wherein the expandable device is radially expandable.

52. The system of claim 35, wherein the expandable device includes a width and a height, the expandable device being expandable to increase the height while the width remains substantially constant.

53. A system for distracting a spinal disc space, comprising:
a delivery instrument including a shaft and an expandable element along a distal portion thereof; and

an expandable device including a cavity, the expandable device being removably mountable to the expandable element with the expandable element in the cavity and each of the expandable device and the expandable element in an unexpanded condition, wherein the expandable device is deliverable with the delivery instrument to a spinal disc space in the unexpanded condition and thereafter expandable with expansion of the expandable element to distract the spinal disc space.

54. The system of claim 53, wherein the expandable device includes a first portion and a second portion, the first and second portions extending between distal and proximal ends of the expandable device.

55. The system of claim 54, wherein the first and second portions each define an outer surface with bone engagement members therealong.

56. The system of claim 54, wherein when expanded the first and second portions define a first height adjacent the distal end of the expandable device and a second height adjacent the proximal end of the expandable device, one of the first and second heights being greater than the other of the first and second heights.

57. The system of claim 56, wherein the expandable device is tapered between the first and second heights.

58. The system of claim 56, wherein the expandable device includes a stepped configuration between the first and second heights.

59. The system of claim 54, wherein the first and second portions include bone growth openings therethrough.

60. The system of claim 54, wherein the first and second portions are structured to maintain an expanded configuration after removal of the expandable element from the cavity therebetween.

61. The system of claim 60, further comprising an elastic core positioned in the cavity.

62. The system of claim 53, further comprising bone filler material positionable in the cavity.

63. The system of claim 62, wherein the bone filler material includes bone growth promoting material.

64. The system of claim 53, wherein the expandable device is radially expandable.

65. The system of claim 53, wherein the expandable device includes a width and a height, the expandable device being expandable to increase the height while the width remains substantially constant.

66. The system of claim 53, wherein in the unexpanded condition the expandable device includes a banana shape.

67. The system of claim 66, wherein in an expanded condition the expandable device includes a D shape.

68. The system of claim 53, wherein the expandable device includes a first portion positionable along an endplate of an upper vertebra and a second portion positionable along an endplate of a lower vertebra, the first and second portions each including a including a size and shape to substantially occupy the adjacent endplate.

69. The system of claim 68, further comprising a motion preserving device between the first and second portions.

70. The system of claim 69, wherein the motion preserving device includes an elastic core having upper and lower convexly curved surfaces.

71. The system of claim 70, wherein the first and second portions each include engagement members for fixing the first and second portions to the adjacent endplate when expanded.